

PATENT
Atty. Dkt. No. APPM/008266/PPC/ECP/CKIM
Serial No.: 10/781,040

IN THE CLAIMS:

Please amend claims 1, 8, 15, and 19, cancel claims 7, 11, 17, and 18 without prejudice, and add new claims 21-26 as follows:

1. (Currently Amended) A method for immersing a substrate into a fluid solution having an anode placed therein, comprising:

loading a substrate into a receiving member ~~configured to support the substrate in a face down orientation;~~

tilting the receiving member to a first tilt angle measured from horizontal;

displacing the receiving member toward the fluid solution at the first tilt angle;
[[and]]

tilting the receiving member to a second tilt angle measured from horizontal when the substrate contacts the fluid solution, the second tilt angle being different from the first tilt angle; and

positioning the substrate at a processing angle such that a plating surface of the substrate is positioned substantially parallel to a surface of the anode placed in the fluid solution, wherein the anode is tilted between about 3° and about 30°.

2. (Original) The method of claim 1, wherein the first tilt angle is between about 3° and about 10°.

3. (Original) The method of claim 1, wherein the second tilt angle is about 0°.

4. (Original) The method of claim 1, further comprising rotating the receiving member at a rotation rate of between about 30 rpm and about 240 rpm.

5. (Original) The method of claim 1, further comprising oscillating the second tilt angle once the substrate is immersed in the fluid solution.

6. (Original) The method of claim 5, further comprising oscillating the substrate in a vertical direction once the substrate is immersed in the fluid solution.

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7. (Cancelled)
8. (Currently Amended) A method for minimizing bubble adherence to a substrate during a substrate immersion process, comprising:
 - tilting the substrate to a tilt angle measured from horizontal;
 - vertically actuating the substrate toward a fluid solution having an anode placed therein while maintaining the tilt angle;
 - reducing the tilt angle to about horizontal once the substrate contacts the fluid solution, while continuing the vertical actuation of the substrate; and
 - positioning the substrate at a processing angle in the vertical actuating is complete such that a plating surface of the substrate is positioned substantially parallel to a surface of the anode placed in the fluid solution, wherein the anode is tilted between about 3° and about 30°.
9. (Original) The method of claim 8, further comprising rotating the substrate at a rate of between about 60 rpm and about 120 rpm.
10. (Original) The method of claim 8, further comprising oscillating the tilt angle of the substrate after the substrate is immersed in the fluid solution and before positioning the substrate at the processing angle.
11. (Cancelled)
12. (Original) The method of claim 8, wherein the tilt angle is between about 3° and about 7°.
13. (Original) The method of claim 8, wherein the tilt angle is reduced to horizontal before the vertical actuation is completed.
14. (Original) The method of claim 8, wherein the tilt angle is greater than 0° at a time when the substrate becomes completely immersed in the fluid solution.

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15. (Currently Amended) A method for immersing a substrate into a plating electrolyte having an anode placed therein, comprising:

- positioning the substrate on a contact ring;
- securing the substrate to the contact ring with a thrust plate assembly;
- tilting the contact ring to a tilt angle of between about 3° and about 7°;
- vertically actuating the contact ring toward the plating electrolyte while maintaining the tilt angle;
- rotating the contact ring at a rotation rate of between about 30 rpm and about 120 rpm;
- reducing the tilt angle to about horizontal when the contact ring initially touches the plating electrolyte; and
- positioning the substrate in a processing position such that a plating surface of the substrate is positioned substantially parallel to a surface of the anode placed in the plating electrolyte, wherein the anode is tilted between about 3° and about 30°.

16. (Original) The method of claim 15, further comprising reducing the tilt angle to about horizontal before stopping the vertical actuation.

17. (Cancelled)

18. (Cancelled)

19. (Currently Amended) The method of claim 15-18, further comprising oscillating the tilt angle of the substrate after the tilt angle is reduced to about horizontal.

20. (Original) The method of claim 15, further comprising maintaining a central axis of the substrate proximate a center of the electrolyte solution during the immersion process.

21. (New) The method of claim 1, further comprising tilting the receiving member from the first tilt angle through an intermediate position to the second tilt angle while

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maintaining the receiving member and the substrate loaded thereon immersed in the fluid solution, wherein at the intermediate position the surface of the substrate is substantially parallel to the surface of the anode.

22. (New) The method of claim 8, further comprising tilting the receiving member from the first tilt angle through an intermediate position to a second tilt angle while maintaining the receiving member and the substrate loaded thereon immersed in the fluid solution, wherein at the intermediate position the surface of the substrate is substantially parallel to the surface of the anode.

23. (New) A method for immersing a substrate into a plating solution contained in a plating cell of a plating apparatus, the plating cell having an anode placed therein, comprising:

loading a substrate into a receiving member of the plating apparatus;
tilting the receiving member to a first tilt angle relative to a surface of the anode;
immersing the substrate into the plating solution of the plating cell;
pivoting the receiving member from the first tilt angle through an intermediate position to a second tilt angle while maintaining the substrate immersed in the plating solution, wherein at the intermediate position the surface of the substrate is substantially parallel to the surface of the anode; and

tilting the substrate being held by the receiving member from the second tilt angle into a third tilt angle such that a plating surface of the substrate is positioned substantially parallel to the surface of the anode.

24. (New) The method of claim 23, wherein the anode is tilted between about 3° and about 30°.

25. (New) The method of claim 23, wherein the anode is not tilted.

26. (New) The method of claim 23, further comprising vertically displacing the substrate while the substrate is immersing inside the plating solution.